

802.11b VCO Phase Noise Performance for the MAX2752 (REP030)

This application note describes the method used to measure the phase noise of the MAX2752 VCO at 2.079GHz. The MAX2361 evaluation kit provides a narrow PLL bandwidth. Software on an IBM PC is used to program the PLL registers. The output phase noise at 10kHz is -74.8dBc/Hz, and -97.8dBc/Hz at 100kHz offset.

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Objective: To measure the phase noise of the 2.4GHz Monolithic Voltage Controlled Oscillator for use in 802.11b DSSS WLAN.

The VCO phase noise of the MAX2752 was measured at 10KHz and 100KHz offset using a spectrum analyzer. Its frequency ranged from 2.038 to 2.110GHz, to cover the IEEE802.11 band of 2412 to 2484MHz, assuming 374MHz IF and low-side injection. The device was locked in a narrow band phase lock loop (PLL). Using a PLL ensured that only VCO noise was measured, rather than the reference frequency multiplied up to RF by the PLL action. A MAX2360 Evaluation Kit was modified to support an off-board VCO. Then, a MAX2300INT interface board with an IBM compatible Windows 98 PC and control software was used to program the MAX2360 registers. All circuits were powered from a +3V supply. The second harmonic of the MAX2752 was also measured. A crystal oscillator provided the reference frequency for the synthesizer.

The MAX2752 is one of a family of Monolithic VCOs for use in the 2.4 to 2.5GHz ISM band. The inductor and varacter elements of the tank are integrated on-chip, greatly simplifying the application of the part. A couple of supply bypass capacitors are the only required external components. The device provides direct connection to the VCO tuning voltage input and the VCO buffer output. The tuning voltage output range is +0.4V to 2.4V and the oscillator frequency tuning range is factory adjusted to provide guaranteed limits. An amplifier stage buffers the output signal to provide higher output power and isolate the device from load impedance variation. The MAX2752 is available in miniature 8-pin μ MAX package.

[Specification Conformance Matrix](#) (PDF, 12K)

[Bench Test Equipment List](#) (PDF, 8K)

[Results](#) (PDF, 90K)

[Measurement Set-Up Diagram](#) (PDF, 119K)

[Phase Lock Loop Block Diagram](#) (PDF, 31K)

PC13Q301, September 2001

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MAX2361: [QuickView](#) -- [Full \(PDF\) Data Sheet \(40k\)](#)

MAX2752: [QuickView](#) -- [Full \(PDF\) Data Sheet \(160k\)](#)

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